APPENDIX A
90TH PERCENTILE CALCULATION METHOD

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A list was made of all the concentration values within one mile of the polygon center. A histogram of these values was created by dividing the range (maximum concentration minus the minimum concentration) into a number of equal sized bins. The bin boundaries were set by putting the maximum and minimum concentrations at the middle of the first and last bin. Each of the concentrations from the list was placed into the appropriate bin such that value was greater than the bin minimum boundary and less than the bin maximum boundary. The cumulative histogram was created by summing the number of concentrations in each bin and all lower bins. This was converted into a fraction by dividing by the total number of concentrations. The bin in the cumulative histogram which exceeds the desired fraction covered was identified (e.g. the 90th percentile). The 90th percentile value is then interpolated The proportional difference between the fractional coverage that exceeded the target fraction and the next smaller bin is used to interpolate the value at the desired fractional coverage.

One result of this algorithm is that if there are too few concentrations to calculate the target percentile, the upper limit of the largest bin is selected. Thus if the maximum value of less than 10 samples is 20, 20 will be the value of the middle of the largest bin in the histogram. The 90th percentile will be estimated as 20 plus a fraction corresponding to half the bin width.

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